Control Panel   **ETV 1961**

The Control Panel is an intelligent terminal used for programming and visualization of automated processes. Process diagnosis, operating and monitoring automated function are simplified using the mounted terminal.

A touch-screen serves as the input medium for process data and parameters; the output is shown on a 19" VGA TFT color display.

With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the terminal.

The available interface connections can be used to exchange process data or configure the terminal. An internal Compact Flash serves as the storage medium for the operating system, application and application data.

The integrated, high-performance VARAN bus enables the direct control of I/O modules.

Contents

Technical Data

Performance data

Processor	AMD Geode LX 800
Cache	128 Kbytes 1st Level
	128 Kbytes 2nd Level
BIOS	INSYDE BIOS
SDRAM (SO-DIMM 200-Pin)	256 Mbytes SDRAM (optional up to 512 Mbytes)
	(There from 16 Mbytes are „Shared Memory" for the graphic controller)
Compact Flash (Type I)	1 Gbyte
SRAM	512 Kbytes (battery buffered)
Interface connections	1 x CAN-Bus
	1 x DIAS-Bus
	2 x VARAN-Bus (maximum length: 100 m)
	1 x Ethernet 10/100 Mbit
	2 x USB V1.1 Type A (Front + back side)
	1 x chip card reader (optional)
Internal interface connections and devices	1 x TFT color display and inverter
	1 x Touch
	1 x Compact Flash socket
Control panel	Touch-Screen (analog resistive)
Display	19" TFT color display
	SXGA, 1280 x 1024 pixels
LEDs	Status displays
Data buffer	Lithium battery
Signal generator	Yes
Real time clock	Yes
Cooling	Active (fan)

Electrical requirements

Supply voltage	Maximum +18 V DC	Maximum +30 V DC
Current consumption of the power supply	Typically 1.8 A (at +24 V)(without external devices connected)	
Starting current	Maximum 20 A for <5 ms	

The device shall be supplied from an isolating transformer having a secondary listed fuse rated either:

a)   max. 5 amps for voltages 0~20 V (0~28.3 Vp), or
b)   100/Vp for voltages of 20~30 V (28.3~42.4 Vp).

Le module doit être alimenté par un transformateur d'isolement avec un fusible sur la sortie de l'enroulement secondaire dont les spécifications sont:

a) max. 5 A pour des tensions 0 ~ 20 V (0 ~ 28,3 Vp), ou
b) 100/Vp pour des tensions de 20 ~ 30 V (28,3 ~ 42,4 Vp).

Terminal

Dimensions	462 mm / 360 mm / 57 mm (H / W / D)
Weight incl. mounting bracket	Typically 7 kg

Control unit

Touch foil	Analog resistive glass touch panel
Active surface	376,3 mm x 301,1 mm
Resolution	12-Bit (4096 x 4096)
Touch precision	< 1.5 % of maximum value (5,6 mm)
Data wheel	No
Buttons	No

Display

Type	19" TFT color display
Resolution	SXGA, 1280 x 1024 pixels
Color depth	18-Bit (262 x 144 colors)
Pixel size	0,294 mm x 0,294 mm
Active surface	376,3 mm x 301,1 mm
Background lighting	4 cold cathode tubes (CCFT, switchable)
Contrast	Typically 1300: 1
Brightness	Typically 300 cd/m²
Visible field CR>10 von	Left and right 89°, above and below 89°

Miscellaneous

Hardware version	1.x
Article number	12-230-1961
Software Macro	LSE LASAL operating system
Project back-up	Internally on Compact Flash
Standardization	UL (E247993)

Environmental conditions

Storage temperature	-20 – +60 °C	
Operating temperature	0 – +45 °C	
Humidity	10 – 90 %, uncondensed	
EMV tolerance	EN 61000-6-2 (industrial area): noise resistance EN 61000-6-4: noise emission	
Vibration tolerance	EN 60068-2-6	2-9 Hz: Amplitude 3,5 mm 9-200 Hz: 1 g (10 m/s²),
Shock resistance	EN 60068-2-27	15 g (150 m/s²), duration 11 ms, 18 Shocks
Protection	EN 60529: Protected through the housing	Front: IP54 cover: IP20

Mechanical Dimensions

in mm
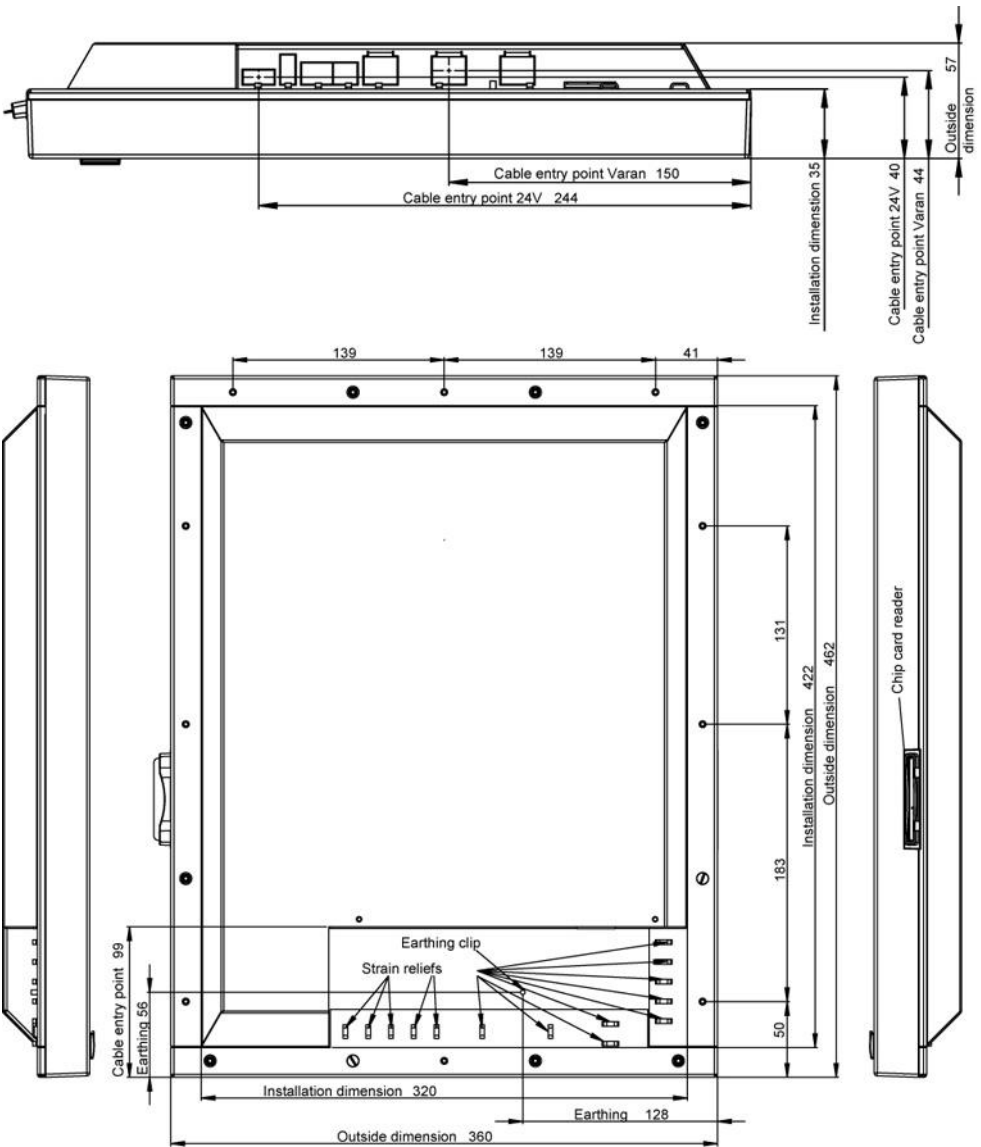
Chemical Resistance

Decorative foil

Solution	Effect over time	
	1 hour	**24 hours**
Methyl, ethyl, ketone	None	None
Cyklohexanol	None	None
Acetone	None	None
Ethanol	None	None
Benzyl alcohol	Yes	Yes
1.1.1.Trichlorethan (Genklene)	None	None
Perchloroethylene (Perklone)	None	None
Trichloroethylene	None	None
Methylene chloride	Yes	Yes
Diethyl ether	None	None
Toluene	None	None
Xylene	None	None
Benzine	None	None
Diesel oil	None	None
Nitric acid <10 %	None	None
Sodium hydroxide <10 %	None	None
Turpentine	None	None
Ethyl acetate	None	None

Touch foil

Solution	Visual Effect
Coal tar oil / toluene	None
Trichloroethylene	None
Acetone	None
Alcohol	None
Benzene	None
Machine oil	None
Ammonia	None
Glass cleaner	None
Mayonnaise	None
Ketchup	None
Wine	None
Salad oil	None
Vinegar	None
Lip stick	None

Connector Layout

Front connector
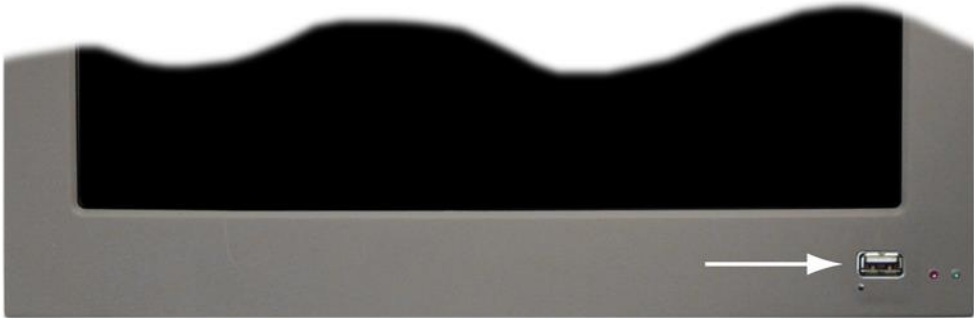
USB Type A V1.1
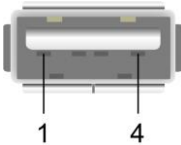
Pin	Function
1	+5V
2	D0-
3	D0+
4	GND

Status Display

Two status LEDs are located on the front (one red and one green LED).

LED status	Definition
Red and green light simultaneously	The ETV 1961 is booting
Red LED blinks only	The operating system is loading
The green LED blinks only	The application is running

Rear connectors

| X1 | X2 | X3 | X4 | X5 | X6 | X7 |
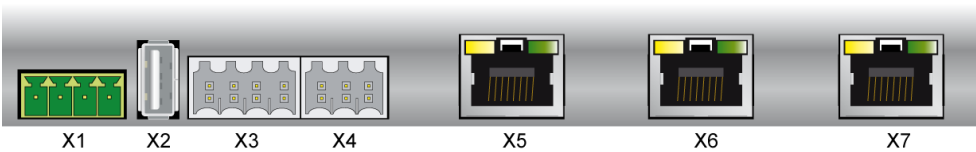
X1: power plug (FK-MCP 1,5/4-ST-3,5)

Pin 1

Pin	Function
1	+24 V supply
2	+24 V supply
3	GND
4	GND

X2: USB Type A V1.1
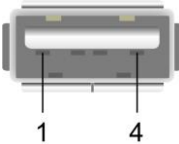
Pin	Function
1	+5 V
2	D0-
3	D0+
4	GND

X3: CAN (Weidmüller B2L 3,5/8)
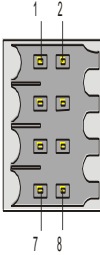
Pin	Function
1	CAN A (CAN LOW)
2	CAN B (HIGH)
3	CAN A (CAN LOW)
4	CAN B (HIGH)
5	GND
6	+5 V
7	GND
8	+24 V

X4: DIAS-Bus (Weidmüller B2L 3,5/6)
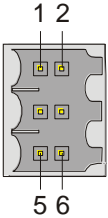
Pin	Function
1	MBUS+
2	MBUS-
3	SBUS+
4	SBUS-
5	GND
6	n.c.

n.c. = do not use

X5: ETHERNET (RJ45)
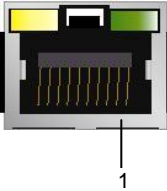
Pin	Function
1	Tx+
2	Tx-
3	Rx+
4 - 5	n.c.
6	Rx-
7 - 8	n.c.

Problems can arise if a control is connected to an IP network, which contains modules that are not running with a SIGMATEK operating system. With such devices, Ethernet packets could be sent to the control with such a high frequency (i.e. broadcasts), that the high interrupt load could cause a real-time runtime error or runtime error. By configuring the packet filter (Firewall or Router) accordingly however, it is possible to connect a network with SIGMATEK hardware to a third party network without triggering the error mentioned above.

Des problèmes peuvent survenir si un automate est connecté à un réseau IP contenant des modules qui ne fonctionnent pas sous un système d'exploitation SIGMATEK. Avec de tels dispositifs, les paquets Ethernet peuvent être envoyés à l'automate avec une fréquence tellement élevée (càd. diffusion), que les interruptions ainsi générées peuvent provoquer une erreur d'exécution. En configurant d'une façon appropriée le filtre de paquets (pare-feu ou un routeur) il est toutefois possible de connecter un réseau avec le matériel SIGMATEK à un réseau tiers sans déclencher l'erreur mentionnée ci-dessus.

For use in local networks only, not telecommunication circuits.

Pour une utilisation dans les réseaux locaux uniquement, et non pas dans de circuits de télécommunications.

X6, X7: VARAN-Bus (RJ45)
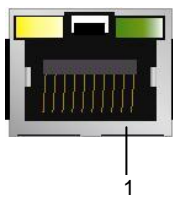
Pin	Function
1	TX/RX+
2	TX/RX-
3	RX/TX+
4	n.c.
5	n.c.
6	RX/TX-
7	n.c.
8	n.c.

LEDs	Function
Yellow	ACTIVE
Green	LINK

n.c. = do not use

LED	Color	Description
ACTIVE	Yellow	Lights when data is received over the VARAN bus.
LINK	Green	Lights when the connection between the two PHs is established.

More information on the VARAN bus can be found in the VARAN bus specifications!

Chip-card reader

A chip-card reader can be added as shown below. The order number for the chip-card reader is: 12-235-011.
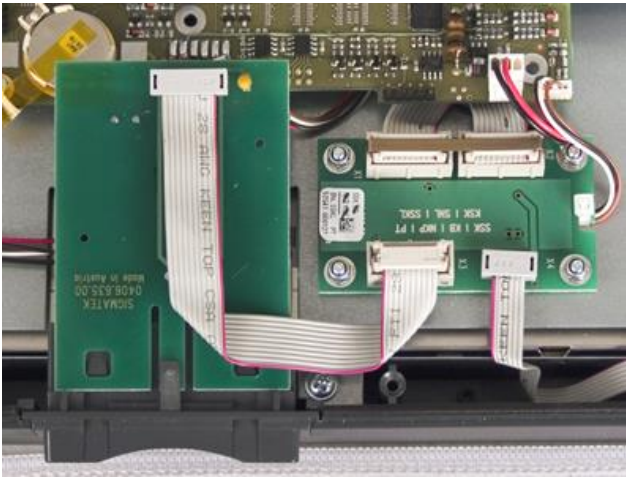
Storage Media

> **It is recommended that only storage media provided by SIGMATEK (CompactFlash cards, microSD cards etc.) be used.**
> **The number of read and write actions have a significant influence on the lifespan of the storage media.**

> **Il est recommandé d'utiliser uniquement les supports de stockage fournis par SIGMATEK (Cartes CompactFlash, cartes microSD, etc).**
> **Le nombre de lectures et d'écritures ont un effet significatif sur la durée de vie du support de stockage.**

Buffer Battery

The exchangeable buffer battery ensures that programs and data in the expanded memory (SRAM) as well the clock time (RTC) are preserved in the absence of a supply voltage. A lithium battery is installed at the manufacturer.

The battery has enough capacity to preserve data in the absence of a supply voltage for up to 2 years.

We recommend however, that the battery be replaced annually to ensure optimal performance.

> Battery order number: 01-690-052

	MANUFACTURER	DATA
Lithium battery	RENATA	3,0 V / 235 mAh

> **Use batteries from RENATA with the number CR2032 only!**
> **WARNING! Battery may explode if mistreated! Do not recharge, disassemble or dispose of in fire!**

> **Remplacer la pile avec RENATA, modèle n° CR2032 uniquement! Utilisation d'une autre pile peut présenter un risque d'incendie ou d'explosion!**

Wiring Guidelines

Earth Connection

The terminal must be connected to earth through the mounting on control cabinet or over the terminal provided. It is important to establish a low-Ohm earth connection, as it is the only way to ensure error-free function. The earth connection must be made with the maximum cross section and largest electrical surface possible.

All noise signals that reach the terminal over external wiring must be filtered over the earth connection. With a large electrical surface, high frequency noise can also be dissipated (skin effect).

Interface module
(Processor module)

C-Dias module

Cable entry

Cable entry
Cable shield grounding (earth)

The control box must
be connected to earth!
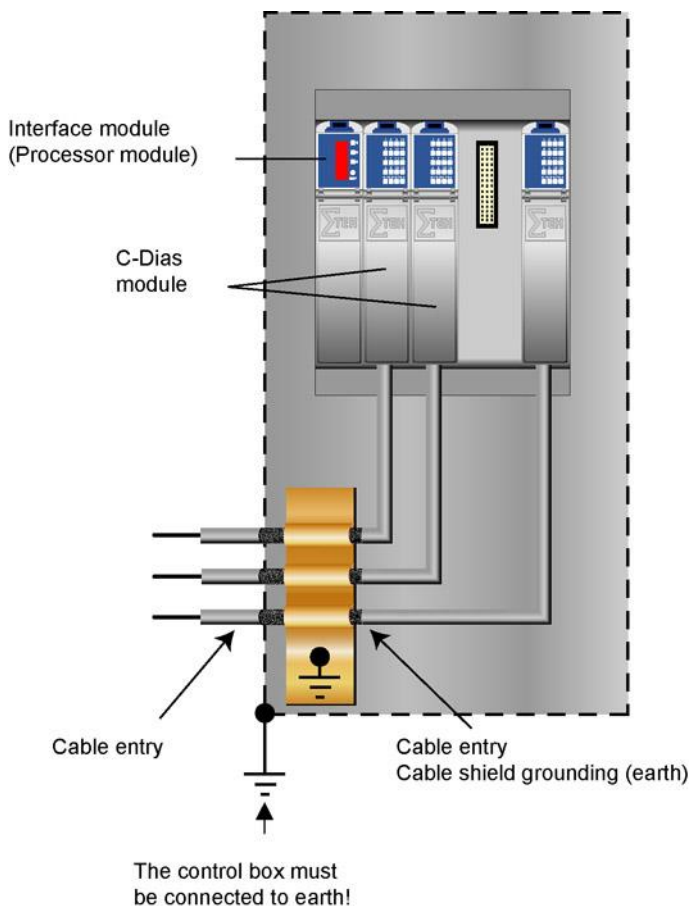
Shielding

For the CAN and DIAS bus wiring, twisted pair shielded wires should be used. The cable shielding must be connected to earth either directly before the terminal over a large sur-face and with low Ohms using grounding clamps or with a blade terminal. With Ethernet and VARAN bus, CAT5 cable with shielded RJ45 connectors is required. The shielding in the CAT5 cable is connected to earth through the RJ45 connector.

Noise signals can therefore be prohibited from reaching the electronics and affecting the function.

ESD protections

Typically, USB devices, such as the keyboard and mouse, are not wired with shielded cables. ESD disruptions destroy theses devices, possibly rendering them irreparable.

Before any device is connected to or disconnected from the terminal, the potential should be equalized (by touching control cabinet or earth terminal).
This will allow the dissipation of electrostatic loads (caused by clothing/shoes).

DIAS bus Termination

In a DIAS bus system, both end modules must be terminated. This is required to avoid data transfer errors that are caused by reflections in the data lines.

The DIAS bus termination is integrated in the terminal and must no longer be built into the DIAS bus connector.

DIAS bus with C-DIAS modules

To ensure a good bus connection, several wiring guidelines must be followed:

- It is important to ensure the cables used are designed for the data transfer speed.
  Data cables (10, 2 x 2 wire TWISTED PAIR, shielded)
  i.e.: LAPPKABEL / UNITRONIC-BUSLEITUNG FD P LD

- Due to the internal resistance of the module, the cable impedance should be 100 Ohms.

- For twisted-pair cables, caution must be taken to ensure that the correct pair are connected with one another:
2x2 pair cables:	Pair 1	MBUS+, MBUS-
	Pair 2	SBUS+, SBUS-

- The shielding must be connected to GND over the widest surface and shortest route possible at both ends

- To connect the individual wires to the connector, the insulation must be removed and the exposed shielding shifted to the side. Only as much insulation as required should be removed.

- It is important to ensure that the send and receive modules are connected to the same GND potential.

> The maximum length allowed for twisted-pair cables 20 M (when using the UNITRONIC BUS cable FD P LD / Company LAPPKABEL)

> La longueur maximale totale d'un câble à paire torsadée est de 20 m (lors de l'utilisation UNITRONIC BUS FD P LD / Fa. LAPPKABEL).

DIAS bus with DIAS modules

The terminal can also be connected to a DIAS module. However, the DIAS modules require a power supply (a DPS 001, for example) as well as an adapter module for connect the twisted-pair cable to the ribbon cable connector (i.e.: DKO 012 /013).

CAN bus Termination

In a CAN bus system, both ends must be terminated. This is required to avoid transfer errors caused through reflections in the line.

CAN bus termination on the clamp module

DSUB plug with termination circuit

CAN bus connection
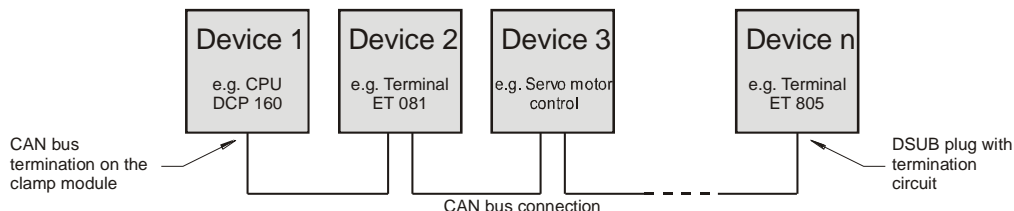
If the terminal is one of the end modules, the termination can be made using a 150-Ohm resistor between CAN A (LOW) and CAN B (HIGH).
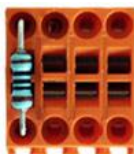
8. USB Interface

The terminal has 2 USB interfaces. These interfaces can be used for various USB devices (keyboard, mouse, storage media, hubs…) in LASAL. Several USB devices can be connected via hub, all completely functional in LASAL. However, for the BIOS setup, the following condition must be noted:

The BIOS setup is only operator-accessible, when the USB keyboard is directly connected to the USB connector. When using a USB hub, malfunctions can appear in the BIOS setup!

La configuration du BIOS est accessible uniquement si le clavier est connecté directement à la prise USB. L'utilisation d'un concentrateur USB peut provoquer des erreurs dans la configuration du BIOS!

It should be noted that many of the USB devices on the market do not comply with USB specifications; this can lead to device malfunctions. It is also possible that these devices will not be detected at the USB port or function correctly. Therefore, it is recommended that every USB stick be tested before actual use.

Il faut souligner que la plupart des périphériques USB sur le marché ne sont pas conformes aux spécifications USB, ce qui peut entraîner des dysfonctionnements de l'appareil. Il est également possible que ces dispositifs ne seront pas détectés par le port USB ou qu'ils ne fonctionnent pas correctement. Par conséquent, il est recommandé que chaque clé USB soit testée avant l'utilisation sur l'automate.

Process Diagram

```
                    ┌─────────────┐
                    │ Main voltage│
                    │     on      │
                    └─────────────┘
                          │
                          │
                      ╱───────╲
                    ╱  Online   ╲        no
                   ╱  with       ╲──────────────┐
                   ╲  Lasal       ╱             │
                    ╲ Software?  ╱              │
                      ╲───────╱                 │
                        │ yes                    │
            ┌───────────────────┐   ┌───────────────────┐
            │   Output of a     │   │   Output of a     │
            │   reset of the    │   │   reset of the    │
            │ peripheral modules│   │ peripheral modules│
            └───────────────────┘   └───────────────────┘
                    │                        │
            ┌───────────────────┐   ┌───────────────────┐
            │   Deletion of     │   │   Deletion of     │
            │    specific       │   │    specific       │
            │   data areas      │   │   data areas      │
            └───────────────────┘   └───────────────────┘
                    │                        │
            ┌───────────┐              ╱───────────╲
            │  Status   │            ╱  Program in   ╲      no
            │  RESET    │           ╱  external memory ╲──────────┐
            └───────────┘           ╲  module functional?╱        │
                                      ╲───────────╱                │
                                          │ yes                     │
                              ┌───────────────────┐        ╱───────────╲
                              │ Copy program into │      ╱  Program in   ╲   no
                              │ application program│     ╱  internal memory ╲────┐
                              │    memory         │      ╲  module functional?╱  │
                              └───────────────────┘       ╲───────────╱         │
                                      │                        │ yes            │
                              ┌───────────────────┐   ┌───────────────────┐  ┌──────────┐
                              │    Status         │   │ Copy program into │  │  Status  │
                              │   RUN ROM         │   │ application program│ │ CHKSUM   │
                              └───────────────────┘   │    memory         │  │   or     │
                                      │               └───────────────────┘  │ POINTER  │
                              ┌───────────┐                   │              └──────────┘
                              │  Call of  │           ┌───────────────────┐
                              │application│           │    Status         │
                              │ program   │           │   RUN ROM         │
                              └───────────┘           └───────────────────┘
                                                               │
                                                       ┌───────────┐
                                                       │  Call of  │
                                                       │application│
                                                       │ program   │
                                                       └───────────┘
```

Status and Error Messages

Status and error messages are shown in the status test of the Lasal Class software. If the CPU has a status display, the status or error number is also show here as well. POINTER or CHKSUM messages are also shown on the terminal screen.

Number	Message	Definition	Cause/solution
00	`RUN RAM`	The user program is currently running in RAM. The display is not affected.	
01	`RUN ROM`	The user program stored in the program memory module has been loaded into the RAM is currently running. The display is not affected.	
02	`RUNTIME`	The total time for all cyclic objects exceed the maximum time; the time can be configured using two system variables: -Runtime: time remaining -SWRuntime: pre-selected value for the runtime counter	
03	`POINTER`	Incorrect program pointers were detected before running the user program	Possible Causes: - The program memory module is missing, not programmed or defect. - The program in the user program memory (RAM) is not executable. - The buffering battery has failed. - The user program has overwritten a software error. Solution: - Reprogram the memory module, if the error reoccurs exchange the module. - Exchange the buffering battery - Correct programming error
04	`CHKSUM`	An invalid checksum was detected before running the user program.	Cause/solution: s. POINTER

05	`WATCHDOG`	The program was interrupted through the watchdog logic.	Possible Causes: - Interrupts blocked by the user program for an extensive period of time (STI instruction forgotten). - Programming error in a hardware interrupt. - INB, OUTB, INW, OUTW instructions used incorrectly. - The processor is defect. Solution: - Correct programming error. - Exchange CPU.
06	`GENERAL ERROR`	General error	
07	`PROM DE-FECT`	An error has occurred while programming the memory module.	Cause: - The program memory module is defect. - The user program is too large. - The program memory module is missing. Solution: - Exchange the program memory module
08	`RESET`	The CPU has received the reset signal and is waiting for further instructions. The user program is not processed.	
09	`WD DEFEKT`	The hardware monitoring circuit (watchdog logic) is defect. After power-up, the CPU checks the watchdog logic function. If an error occurs during this test, the CPU deliberately enters an infinite loop from which no further instructions are accepted.	Solution: Exchange CPU.
10	`STOP`		
11	`PROG BUSYS`		
12	`PROGRAM LENGTH`		
13	`PROG END`	The memory module was successfully completed.	
14	`PROG MEMO`	The CPU is currently programming the memory module.	

15	STOP BRKPT	The CPU was stopped by a breakpoint in the program.	
16	CPU STOP	The CPU stopped by the PG software (F6 HALT in status test).	
17	INT ERROR	The CPU has triggered a false interrupt and stopped the user program or has encountered an unknown instruction while running the program.	Cause: - A nonexistent operating system was used. - Stack error (uneven number of PUSH and POP instructions). - The user program was interrupted by a software error. Solution: - Correct programming error.
18	SINGLE STEP	The CPU is in single step mode and is waiting for further instructions.	
19	READY	A module or project was sent to CPU and is ready to run the program	
20	LOAD	The program is stopped and the CPU is currently receiving a new module or project.	
21	UNZUL. MODUL	The CPU has received a module that does not belong to the project.	
22	MEMORY FULL	The operating system memory /Heap) is too small. No memory could be reserved while calling an internal or interface function is called from the application.	
23	NOT LINKED	When starting the CPU, a missing module or a module that does not belong the project was detected.	
24	DIV BY 0	A division error has occurred.	Possible Causes: - Division by 0. - The result of a division does not fit in the result register. Solution: Correct programming error.

25	`DIAS ERROR`	While accessing a DIAS module, an error has occurred.	Possible Causes: - An attempt is made to access a nonexistent DIAS module. - DIAS bus error. Solution: - Check the DIAS bus - Check the termination resistors.
26	`WAIT`	The CPU is busy.	
27	`OP PROG`	The operating system is currently being reprogrammed.	
28	`OP INSTALLED`	The operating system has been reinstalled.	
29	`OS TOO LONG`	The operating system cannot be loaded; too little memory.	
30	`NO OPERATING SYSTEM`	Boot loader message. No operating system found in RAM.	
31	`SEARCH FOR OS`	The boot loader is searching for the operating system in RAM.	
32	`NO DEVICE`		
33	`UNUSED CODE`		
34	`MEM ERROR`	The operating system loaded does not match the hardware configuration.	
35	`MAX IO`		
36	`MODULE LOAD ERROR`	The LASAL Module or project cannot be loaded.	
37	`GENERELLER BS-FEHLER`	A general error has occurred while loading the operating system.	
38	`APPLMEM ERROR`	An error has occurred in the application memory (user heap).	
39	`OFFLINE`		
40	`APPL LOAD`		
41	`APPL SAVE`		

45	**VARAN ERROR**	A required VARAN client was disconnected or communication error has occurred.	
46	**APPL-LOAD-ERROR**	An error has occurred while loading the application.	
47	**APPL-SAVE-ERROR**	An error has occurred while attempting to save the application.	
50	**ACCESS-EXCEPTION-ERROR**	A read or write access of a re-stricted memory area. (I.e. writing to the NULL pointer).	
51	**BOUND EXCEEDED**	An exception error caused by exceeding the memory limits	
52	**PRIVILEDGED INSTRUC-TION**	An unauthorized instruction for the current CPU level was given. For example, setting the segment register.	
53	**FLOATING POINT ERROR**	An error has occurred during a floating-point operation.	
60	**DIAS-RISC-ERROR**	Error from the Intelligent DIAS-Master.	
64	**INTERNAL ERROR**	An internal error has occurred, all applications are stopped.	Restart; report error to Sigmatek.
65	**FILE ERROR**	An error has occurred during a file operation.	
66	**DEBUG ASSERTION FAILED**	Internal error.	Restart; report error to Sigmatek.
67	**REALTIME RUNTIME**	The total time for all real time objects exceeds the maximum time allowed. The time cannot be configured. 2 ms for 386 CPUs 1 ms for all other CPUs	Starting from Version 1.1.7
68	**BACKGROUND RUNTIME**	The total time for all background objects exceed the maximum time; the time can be configured using two system variables: -BTRuntime: time remaining -SWBTRuntime: pre-selected value for the runtime counter	

70	`C-DIAS ERROR`	An error occurred in connection with a C-DIAS module.	Cause: - The reason for this error is documented in the log file Solution: - Depends on the cause
72	`S-DIAS ERROR`	A connection error with a S-DIAS module has occurred.	Possible causes: - real network does not match the project - S-DIAS client is defective Solution: - analyze logfile
95	`USER DEFINED 0`	User-definable code.	
96	`USER DEFINED 1`	User-definable code.	
97	`USER DEFINED 2`	User-definable code.	
98	`USER DEFINED 3`	User-definable code.	
99	`USER DEFINED 4`	User-definable code.	
100	`C_INIT`	Initialization start; the configuration is run.	
101	`C_RUNRAM`	The LASAL project was successfully started from RAM.	
102	`C_RUNROM`	The LASAL project was successfully started from ROM.	
103	`C_RUNTIME`		
104	`C_READY`	The CPU is ready for operation.	
105	`C_OK`	The CPU is ready for operation.	
106	`C_UNKNOWN_CID`	An unknown object from a stand-alone or embedded object, or an unknown base class was detected.	
107	`C_UNKNOWN_CONSTR`	The operating system class cannot be created; the operating system is probably wrong.	
108	`C_UNKNOWN_OBJECT`	Indicates an unknown object in an interpreter program; more than one DCC080 object.	
109	`C_UNKNOWN_CHNL`	The hardware module number is greater than 60.	

110	`C_WRONG_CONNECT`	No connection to the required channels.	
111	`C_WRONG_ATTR`	Wrong server attribute.	
112	`C_SYNTAX_ERROR`	Non-specific error. Recompile and download all project sections.	
113	`C_NO_FILE_OPEN`	An attempt was made to open an unknown table.	
114	`C_OUTOF_NEAR`	Memory allocation error	
115	`C_OUT OF_FAR`	Memory allocation error	
116	`C_INCOMAPTIBLE`	An object with the same name already exists but has a different class.	
117	`C_COMPATIBLE`	An object with the same name and class already exists but must be updated.	
224	`LINKING`	The application is currently linking.	
225	`LINKING ERROR`	An error has occurred while linking. An error messaged is generated in the LASAL status window.	
226	`LINKING DONE`	Linking is complete.	
230	`OP BURN`	The operating system is currently being burned into the Flash memory.	
231	`OP BURN FAIL`	An error has occurred while burning the operating system.	
232	`OP INSTALL`	The operating system is currently being installed.	
240	`USV-WAIT`	The power supply was disconnected; the UPS is active.	
241	`REBOOT`	The operating system is restarted.	
242	`LSL SAVE`		
243	`LSL LOAD`		
252	`CONTINUE`		
253	`PRERUN`	The application is started.	
254	`PRERESET`	The application is ended.	

255	CONNECTION BREAK		

Further addressing information can be found in the VARAN bus specifications.

VARAN Recommended Shielding

The VARAN real-time Ethernet bus system offers robust performance in harsh industrial environments. Through the use of IEEE 802.3 standard Ethernet physics, the potential between an Ethernet line and sending/receiving components is kept separate. The VARAN Manager resends messages to a bus participant immediately when an error occurs. It is principally recommended that the shielding guidelines below be followed.

For applications in which the bus line is run outside the control cabinet, correct shielding is required. This is especially important, if due to physical requirements, the bus lines must be placed next to sources of strong electromagnetic noise. It is recommended that whenever possible, to avoid wiring VARAN-Bus lines parallel to power cables.

SIGMATEK recommends the use of **CAT5e** industrial Ethernet bus lines.

For the shielding variants, an **S-FTP bus line** is recommended, which is a symmetric, multi-wire cable with unshielded pairs. For the total shielding, a combination of foil and braiding is used; it is recommended that an unvarnished variant be used.

The VARAN cable must be secured at a distance of 20 cm from the connector for protection against vibration!

| |
|---|
| **Le câble VARAN doit être protégé contre les vibrations à moins de 20 cm du connecteur (par exemple à l'aide d'une pince)!** |

1. Wiring from the Control Cabinet to an External VARAN Component

If the Ethernet lines are connected from a VARAN component to a VARAN node outside the control cabinet, the shielding should be placed at the entry point to the control cabinet housing. All noise can then be deflected from the electronic components before reaching the module.
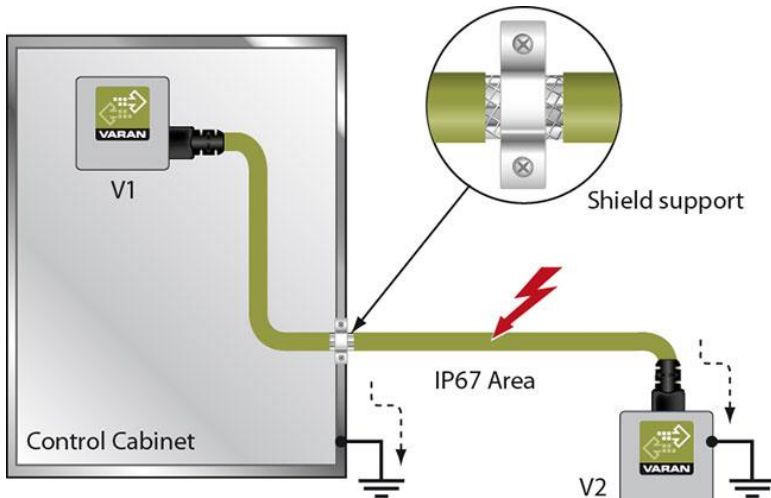
2. Wiring Outside of the Control Cabinet

If a VARAN bus cable must be placed outside of the control cabinet only, no additional shield connection is required. This requires that only IP67 modules and connectors be used. These components are very robust and noise resistant. The shielding for all sockets in IP67 modules are internally connected to common bus or electrically connected to the housing, whereby the deflection of voltage spikes does not flow through the electronics.
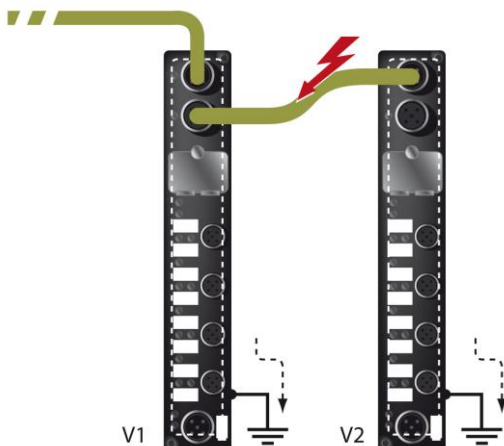
3. Shielding for Wiring Within the Control Cabinet

Sources of strong electromagnetic noise located within the control cabinet (drives, Trans-formers, etc.) can induce interference in a VARAN bus line. Spike voltages are deflected over the metallic housing of a RJ45 connector. Noise is conducted through the control cabinet housing without further action from the electronic components To eliminate sources of noise during data transfer, it is recommended that the shielding from all electronic com-ponents be connected within the control cabinet.


Shield support
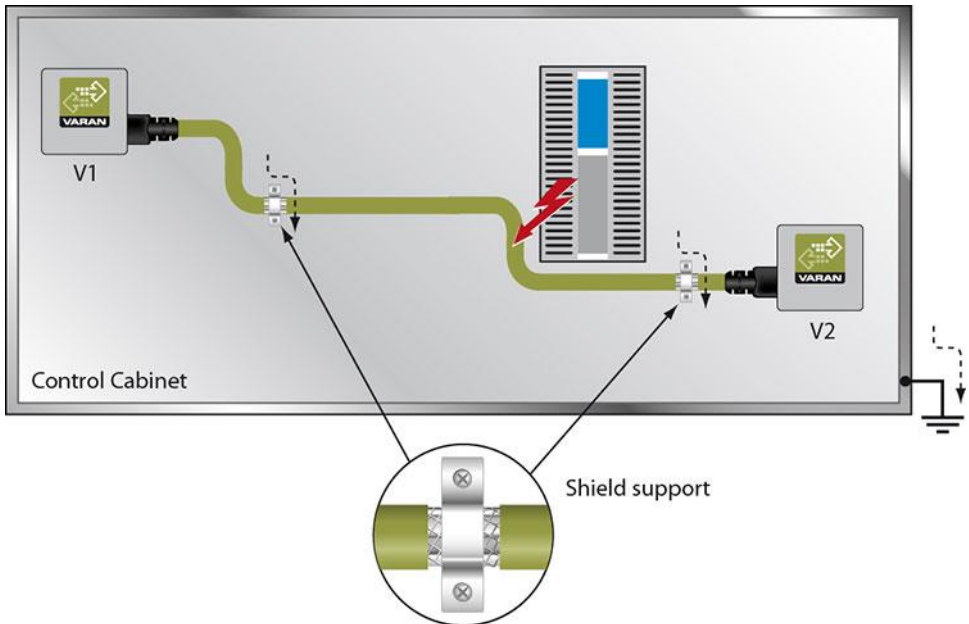
4. Connecting Noise-Generating Components

With the connection of power components that generate strong electromagnetic noise, it is also critical to ensure correct shielding. The shielding should be placed before a power component (or a group thereof).

Shield support
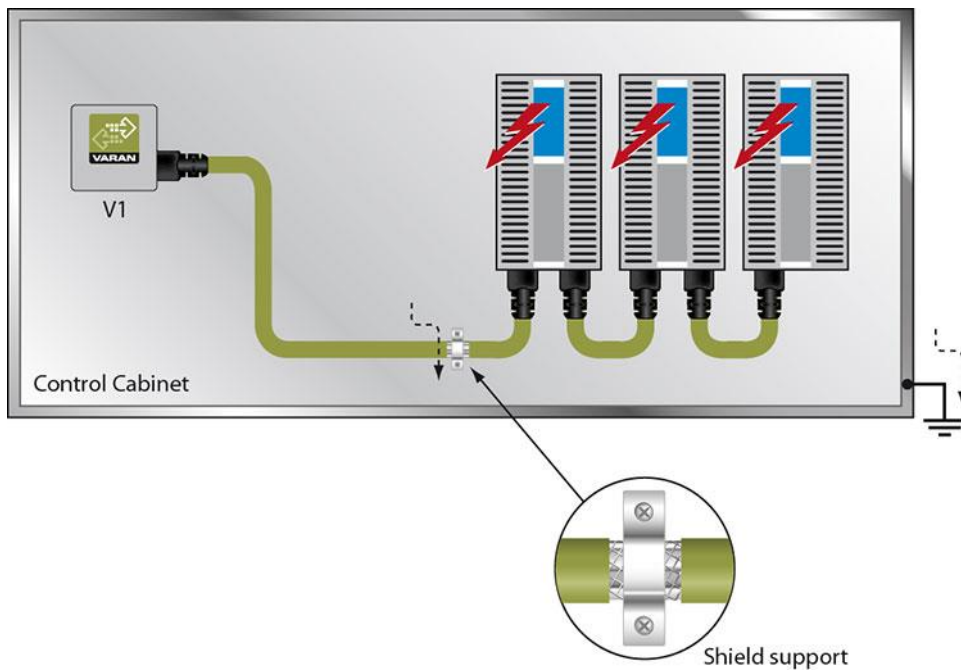
5. Shielding Between Two Control Cabinets

If two control cabinets must be connected over a VARAN bus, it is recommended that the shielding be located at the entry points to both cabinets. Noise can thereby be kept from reaching the electronics within the control cabinet.

Shield support
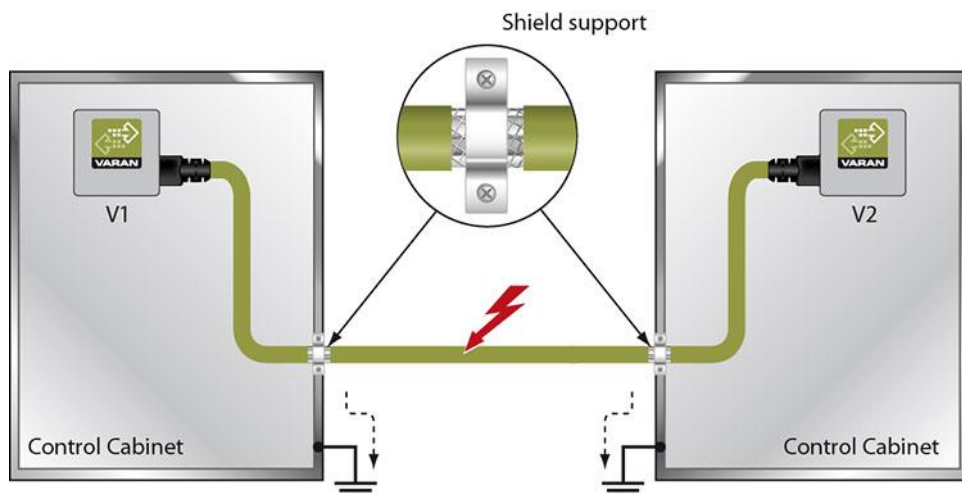
Cleaning the Touch Screen

> **CAUTION!**
> **Before cleaning the touch screen, the terminal must first be turned off to avoid unintentionally triggering commands or functions!**

> **ATTENTION!**
> **Avant de nettoyer l'écran tactile, le terminal doit d'abord être éteint afin d'éviter un déclanchement involontaire des commandes!**

The terminal's touch screen can only be cleaned with a soft, damp cloth. To dampen the cloth, a screen cleaning solution such as anti static foam, water with a mild detergent or alcohol should be used. The cleaning solution should be sprayed onto the cloth and not directly on the terminal. The cleaning solution should not be allowed to reach the terminal electronics, for example, through the ventilation slots.

No erosive cleaning solutions, chemicals, abrasive cleansers or hard objects that can scratch or damage the touch screen may be used.

If the terminal comes in contact with toxic or erosive chemicals, carefully clean the terminal immediately to prevent acid damage.

> **To ensure the optimal function of the terminal, the terminal should be cleaned regularly!**

> **To extend the lifespan of the touch screen as much as possible, using the fingers to operate the terminal is recommended.**

> **Pour garantir le fonctionnement optimal du terminal, le terminal doit être nettoyé régulièrement!**

> **Pour prolonger la durée de vie de l'écran tactile on recommande d'utiliser les doigts pour l'opérer.**